CX800B
Tier 3
Crawler Excavator

SERVICE MANUAL

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CASE CONSTRUCTION

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WARNING: *This symbol is used in this manual to indicate important safety messages. Whenever you see this symbol, carefully read the message which follows. Your safety depends on it.* M171C

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Diagnostic aid

If an intermittent problem is suspected, the cause may be one of the following.

- Harness connector connection problem
- Harness routing problem
- Breakage in harness covering due to friction
- Wire disconnection within harness covering

In order to detect these causes, the following inspection is necessary.

- Harness connector and ECM connector connection problem
  - Terminal has come out from connector
  - Connection between non-matching terminals
  - Damage to connector lock
  - Terminal and wire connection problem
- Harness damage
  - Inspect the external appearance to check for any harness damage.
  - While moving the connector or harness related to a sensor, confirm the display of the related item in the scan tool data display. The display change shows the trouble location.

Breaker box inspection procedure

For steps in which breaker box usage is indicated, perform inspection with the following procedure.
Return to diagnosis step after inspection.

Step	Inspection item	Inspection method	Measurement condition	Measurement terminal No.	Normal value	Abnormal value
6	Short circuit with power supply circuit	Voltage value measurement	• Remove the sensor connector. • Key switch "ON"	82-GND 90-GND	0 V	18 V or higher
7	Disconnection/ high resistance	Resistance measurement	• Remove the sensor connector. • Key switch "OFF"	82-Sensor connector signal terminal 90-Sensor connector signal terminal	100 Ω or lower	10 MΩ or higher
8	Disconnection/ high resistance	Resistance measurement	• Remove the sensor connector. • Key switch "OFF"	101-Sensor connector GND terminal	100 Ω or lower	10 MΩ or higher

Inspection procedures for sensors on actual machine

1. Disconnect the intermediate connectors and perform sensor inspection from the engine harness connector.
2. Disconnect the connector from the sensor and short circuit the sensor connector wiring.
3. Inspect the harness disconnection from the intermediate connector.
   - If there is an abnormality in both procedures 1 and 2, repair the harness and repeat inspection from procedure 1.
   - If there is an abnormality in procedure 1 only, replace the sensor.

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Engine Output Deficiency

Preliminary inspection

Before using this section, implement a "Service support monitor system check" and check all of the following items.

- The ECM and shovel controller are operating correctly.
- Check diagnostic trouble codes.
- Check the condition of the main unit and find applicable symptoms in the problem symptom list. Implement the procedure indicated in the symptom chart.
- Confirm with the customer that the stipulated engine oil and fuel are being used.

There are various possible causes for output deficiencies, so thoroughly investigate the relationship between the engine main unit and main unit side.

- Check under what kind of operation conditions the output deficiency occurs.

If hesitations or lagdown is included in the symptom of the output shortage, the fault is related to the machine side control. Contact the machine manufacturer.

Visual inspection

Some symptoms detection procedures require careful visual inspection. This allows for problems to be repaired without performing further inspection, which saves valuable time. The following items are included in this inspection.

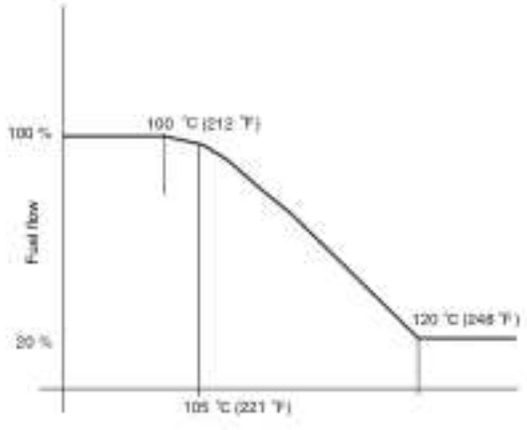
- Check whether the air cleaner element is dirty or clogged.
- Check for correct wiring connections, tightness, and disconnections
- Check whether the power supply for commercially-available accessories is being diverged from the ECM power supply.
- Check whether the ECM ground is dirty and check that it is securely installed in the correct location.
- Check that pipes and hoses for fuel, air, and oil are not broken or twisted and that they are correctly connected. Thoroughly check for any leaking or clogging.
- Check for fuel leaks and damage and denting on pipes in the fuel system.
- Increased resistance among suction air system parts, especially resulting from a dirty air cleaner element, clogging, and crushing in the intake air line
- Exhaust system parts abnormality

Diagnostic aid

- Fuel system abnormality (fuel cut-off, fuel freezing, air entering fuel line, filter abnormality (main, gauze clogging), line abnormality, fuel quality, fuel tank (debris, fuel suction abnormality)
- Intake air system abnormality (filter clogging, intake air line abnormality)
- Exhaust system abnormality (exhaust brake, exhaust pipe abnormality)
- Sensor input circuit system abnormality (sensor, harness)
- Switch input circuit system abnormality
- Engine main unit abnormality (compression pressure, valve clearance, turbo charger, supply pump, injector, common rail, other mechanical trouble)
- Trouble related to main unit-side device (hydraulic pump, etc.)
- Effect of electrical components installed after purchasing (wireless devices, lights, etc.)
- Perform inspection to check whether there are any connector connection problems, abnormalities involving friction or breaking in harnesses, and whether any wires inside harnesses are touching another circuit and causing a short. Also, perform function diagnosis inspection, check operations and control in each area, and repair any abnormalities.
- Output reduction due to fuel flow restriction resulting from overheating
- Output reduction due to fuel flow restriction resulting from high altitude operation

Control for overheating

During overheating, in order to protect the engine, restriction of the fuel flow will start if the engine coolant temperature exceeds 100 °C (212 °F). If the engine coolant temperature rises further, the fuel flow is further restricted. Near 120 °C (248 °F), the fuel flow will be restricted to a constant level. The system will emit a warning through the main unit from 105 °C (221 °F). By lowering the load applied to the main unit, in addition to the warning, it is possible to avoid an operation condition in which the fuel flow is restricted.



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Applicable part	Inpection and measurement location	permissible limit value	Repair, solution procedure
Roller bearing (13) Roller bearing (14)	Rotation surface	Flaking Or pressure imprinting is occurring.	Replace the roller bearings (13) (14).
	Operation	There are rotation abnormalities (abnormal noises, rotation unevenness)	
Piston assembly (11)	Shoe sliding surface	1.6 a degree of roughness Or the surface is rough and there is scratching at least 0.02 mm (0.0007 in) deep.	Lap the shoe sliding surface (#1000). If the scratching cannot be removed, replace using the case kit.
	Piston outer diameter	1.2 a degree of roughness Or the surface is rough and there is scratching at least 0.02 mm (0.0007 in) deep.	Replace using the case kit.
	Piston outer diameter and case (1) inner diameter	Gap 0.030 mm 0.0011 in)	
	Shoe ball backlash	0.7 mm of backlash (0.02 in)	
Spool assembly (2-2)	Spool outer diameter	0.8 a degree of roughness There is scratching at least 0.02 mm deep or the surface is rough.	Replace using the base plate kit.
	Spool outer diameter and base plate inner diameter	Gap 0.050 mm (0.0019 in)	
Base plate (2-1)	Orifice (2-2) mounting hole	0.8 a degree of roughness There is scratching at least 0.02 mm (0.0007 in) deep. Or the surface is rough.	Replace using the base plate kit.
	Base plate inner diameter and spool outer diameter	Gap 0.050 mm (0.0019 in)	
	Orifice (2–6-2) mounting hole	0.8 a degree of roughness There is scratching at least 0.02 mm deep. Or the surface is rough.	
	Base plate inner diameter and valve assembly outer diameter	Gap 0.040 mm (0.0015 in)	
	Relief valve assembly free piston sliding and seat sections	There is scratching at least 0.02 mm (0.0007 in) deep. Or the surface is rough.	
Valve assembly (2-9)	Spool outer diameter	0.8 a degree of roughness There is scratching at least 0.02 mm (0.0007 in) deep. Or the surface is rough.	Replace using the base plate kit.
	Spool outer diameter and base plate inner diameter	Gap 0.040 mm (0.0015 in)	
Free piston (2-7-10)	Sliding section against the base plate and seat section	There is scratching at least 0.02 mm (0.0007 in) deep. Or the surface is rough.	Replace using the relief valve assembly.
Housing (2-7-2)	Sliding section (outer diameter)	There is scratching at least 0.02 mm (0.0007 in) deep. Or the surface is rough.	
Spring (2-4)	Appearance dimensions	Free length 65 mm (2.55 in)	Replace the spring.
	Appearance	There is deformation and scratching on the coil surface.	
Spring (2-13)	Appearance	There is deformation and scratching on the coil surface.	Replace the spring.
Spring (2-20)	Appearance dimensions	Free length 42 mm (1.65 in)	Replace the spring.
	Appearance	There is deformation and scratching on the coil surface.	
Spring (12)	Appearance dimensions	Free length 49.7 mm (1.95 in)	Replace the spring.
	Appearance	There is deformation and scratching on the coil surface.	
Spring (17)	Appearance dimensions	Free length 41.8 mm (1.65 in)	Replace the spring.
	Appearance	There is deformation and scratching on the coil surface.	
Spring (26)	Appearance dimensions	Free length 40.3 mm (1.58 in)	Replace the spring.
	Appearance	There is deformation and scratching on the coil surface.	
Each O-ring and oil seal		During disassembly	Replace each O-ring and oil seal.

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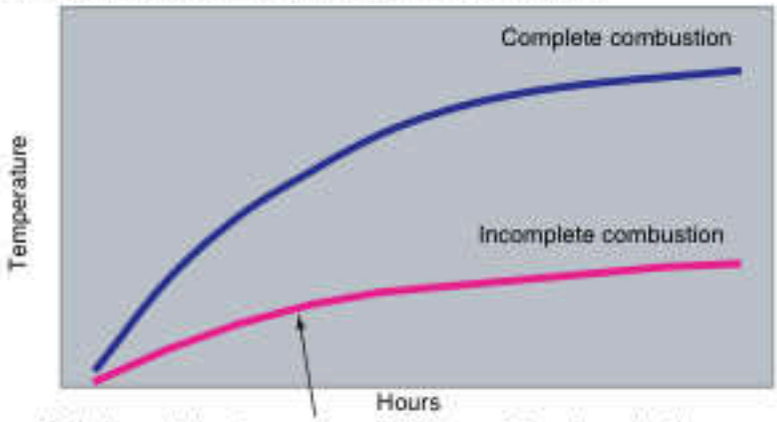
Injector Inspection Methods Using A Thermogun

Common rail-type fuel injection device injectors are located inside the head cover, and inspection (removal and installation of couplers, outside injection from cylinder) cannot be performed. An inspection method for mechanical problems (spray deficiencies, clogging, seizing) for which a diagnostic trouble code does not appear is necessary.

Judgment through temperature measurement

For engines in which combustion conditions are normal, the temperature of each cylinder will ordinarily increase.
However, for cylinders in which there is trouble and combustion conditions are poor, it is difficult for the temperature to increase.
Use these characteristics and observe the temperature change in each cylinder to judge whether there are cylinder problems.

«Difference in temperature change by state of combustion»



Cylinders with low temperature have poor status of combustion.

Therefore, you can judge that there has been some kind of trouble.

TSSA0001

The cause of the problem is often a defect (spray deficiencies, clogging, seizing) with the injector itself.
Also investigate other causes and thoroughly perform trouble diagnosis before deciding what the problem is.

Thermogun

A thermogun is a infrared thermometer capable of non-contact temperature measurement.
As a maintenance tool, this is sold as a thermogun and infrared thermometer.

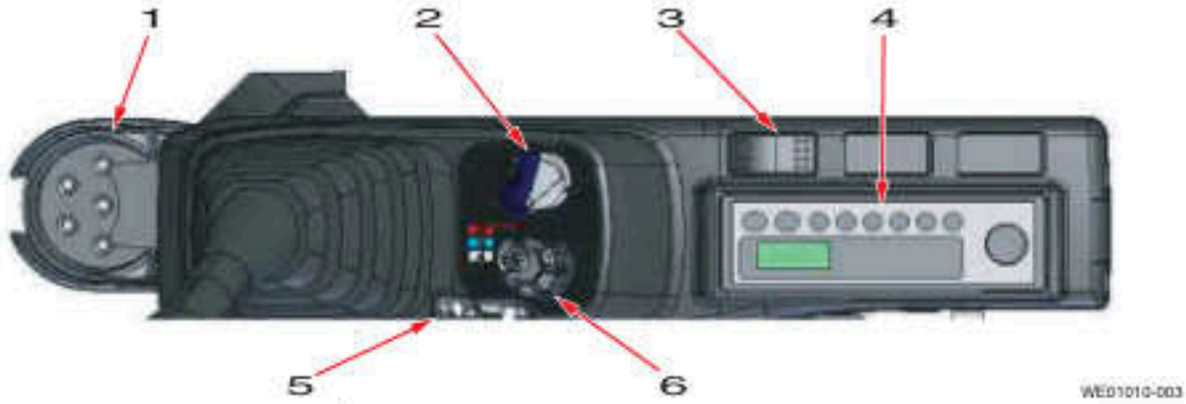
- Ideal for measuring temperatures from 0 °C to 500 °C (32 °F to 932 °F).
- Includes laser pointer
- Includes spot measurement function (convergence ratio of about 10:1)



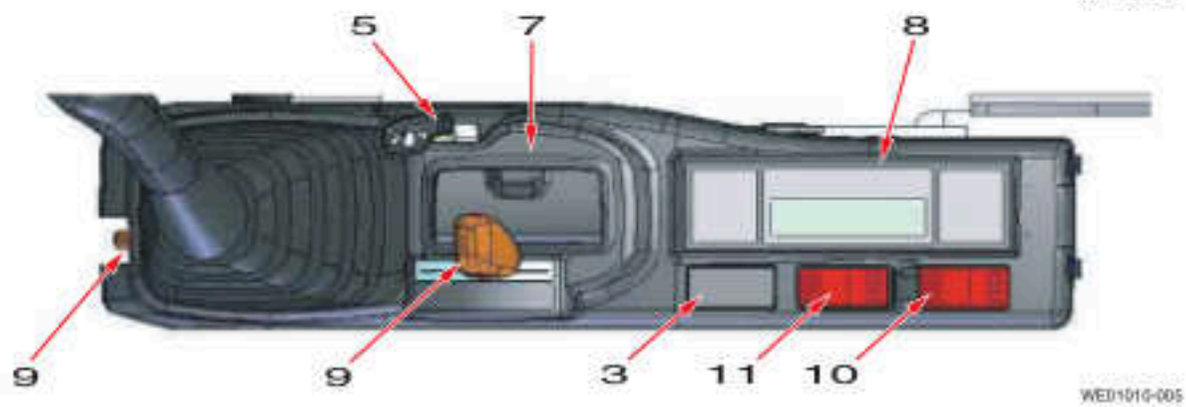
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Layout Around Operator Seat

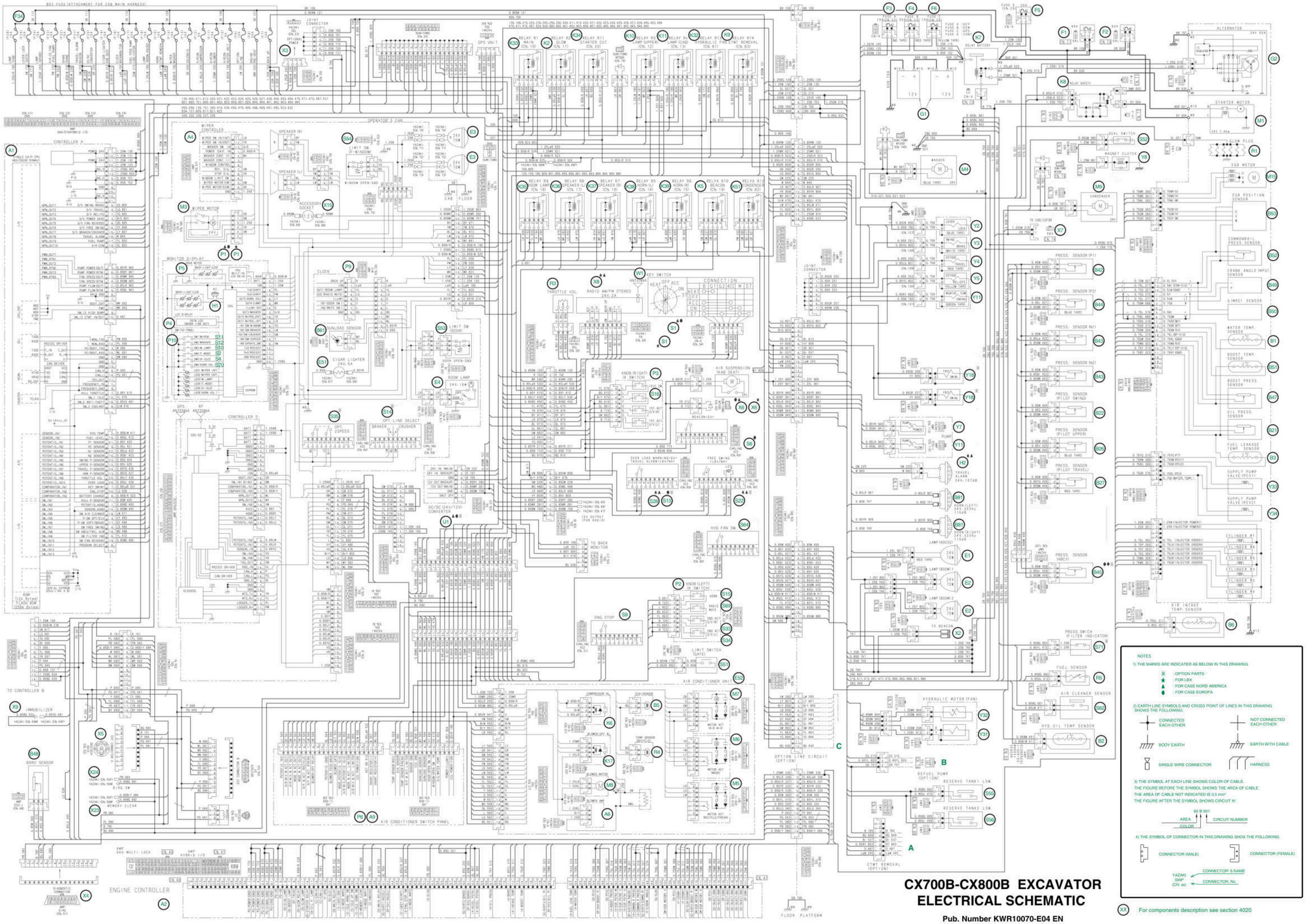






1	Cup holder	7	Ashtray
2	Key switch	8	Air conditioner control panel
3	Rocker switch base	9	Gate lever
4	AM / FM radio	10	Emergency stop switch
5	Tilt lever	11	Hydraulic motor fan reverse switch
6	Throttle volume		

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CX700B-CX800B EXCAVATOR ELECTRICAL SCHEMATIC

Pub. Number KWR10070-E04 EN

NOTES

1) THE MARKS ARE INDICATED AS BELOW IN THIS DRAWING.
- ※ : OPTION PARTS
- ★ : FOR LBX
- ▲ : FOR CASE NORD AMERICA
- ● : FOR CASE EUROPA

2) EARTH LINE SYMBOLS AND CROSS POINT OF LINES IN THIS DRAWING SHOWS THE FOLLOWING.
- CONNECTED EACH OTHER
- NOT CONNECTED EACH OTHER
- BODY EARTH
- EARTH WITH CABLE
- SINGLE WIRE CONNECTOR
- HARNESS

3) THE SYMBOL AT EACH LINE SHOWS COLOR OF CABLE.
THE FIGURE BEFORE THE SYMBOL SHOWS THE AREA OF CABLE.
THE AREA OF CABLE NOT INDICATED IS 0.5 mm²
THE FIGURE AFTER THE SYMBOL SHOWS CIRCUIT N°.

60 B 001
AREA — CIRCUIT NUMBER
COLOR

4) THE SYMBOL OF CONNECTOR IN THIS DRAWING SHOS THE FOLLOWING.
- CONNECTOR (MALE)
- CONNECTOR (FEMALE)
- YAZAKI SWP (CN. xx) — CONNECTOR: S NAME, CONNECTOR: No

(XX) For components description see section 4020

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